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ABSTRACT

North Carolina, with a large number of major rivers, lakes, and reservoirs, and 320 miles of ocean shoreline, has a comparatively high drowning rate. A study was conducted to examine drowning deaths that occurred in North Carolina between 1980 and 1984. Data were obtained from the Office of the Chief Medical Examiner. Data from Drowning Abstract Forms and selected items from the Medical Examiner computer file, such as the decedent's blood alcohol percent, were summarized to form descriptive statistics on all the drownings. Cross tabulations were generated to see how certain characteristics varied by activity of decedent and setting of drowning. A total of 1,052 drownings were abstracted, with males accounting for 87% of the drownings. Nonwhite males had the highest drowning rates across all age groups; the drowning rate was higher for nonwhites than for whites, and higher for males than for females. An examination of activities revealed that, while most drownings occurred during swimming, there was a large number of nonswimming drownings. Of the 839 drowning victims who were tested for blood alcohol, 34% were legally intoxicated. Findings from the study suggest that some of these drowning were preventable, including those where the victim was swimming alone, those involving boats, those where the victim was in the 0-5 age group, and those in which alcohol was involved. (NB)

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DROWNING DEATHS IN NORTH CAROLINA

by

Michael J. Patetta

CG 020017

INTRODUCTION

It has been shown that the availability and nature of bodies of water in an area are closely related to the frequency of drowning. Nations with comparatively high drowning rates include India, Japan, and Mexico, all of which are nations in close proximity to water. (1) With approximately 320 miles of ocean shoreline, 65 major rivers, and 100 major lakes and reservoirs, it should come as no surprise that the State of North Carolina has a comparatively high drowning rate. In fact, U.S. data from 1977 to 1979 show that only 14 states had a higher drowning rate than North Carolina (2).

What part can public health officials play to reduce the high drowning rate? A first step could be examining the circumstances surrounding the death. What activity did the decedent engage in before drowning, in what setting did the drowning occur, were there other fatalities involved in the incident, and what was the blood alcohol concentration of the decedent? These and other questions are addressed in the present study.

BACKGROUND

In 1984, drowning was the third leading cause of death due to unintentional injury in the United States, with only motor-vehicle deaths and falls having a higher total number of injury deaths. The overall drowning rate is highest in the 0-4 and 15-24 year age groups. (3) Furthermore, the rate for blacks is about twice that for whites. The only exception is with children ages 1 to 4 among whom the rate for whites is almost twice that for blacks. (2)

The male to female ratio of drowning rates is about 12:1 for those related to boats and about 5:1 for all others. Drowning rates by age and sex show that for males the rate peaks at age 2, declines until about age 10, and then peaks at age 18. For females, the rate peaks at age 1, decreases sharply and does not rise again. (2)

A 1971 study of 5,237 drownings in the U.S. conducted by the U.S. Department of Health, Education, and Welfare (HEW) (4) showed that approximately 36% of

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the drowning victims were swimming before they drowned. Most of these drownings occurred while swimming in an unorganized facility. The study also showed that approximately 14% of the victims were playing adjacent to water, 11% were standing or walking near water, 7% were in a motor vehicle crash, 7% were fishing from a boat, 3% were motorboating, 3% were attempting a rescue, and 2% were taking a bath. Popular water sport activities such as canoeing, sailing, and scuba diving each accounted for 1% of the drownings.

This 1971 study indicated that activities associated with drowning varied by age. Children less than five accounted for 64% of the bathtub drownings and 69% of the victims who were playing adjacent to water, while they contributed only 16% of the total drownings. Other activities associated with age included bathing or wading (58% were 5-14 years), swimming (58% were 10-19 years), playing on a raft or float (82% were 5-19 years), playing on ice (95% were 1-14 years), motorboating (43% were 25-44 years), canoeing (79% were 15-34 years), and scuba diving (76% were 15-34 years). For drowning victims ages 65 and over, 48% were reported to have been standing or walking near water before they drowned. (4)

The main settings associated with the drownings were lakes or ponds (35%), rivers or creeks (29%), swimming pools (13%), oceans or bays (9%), and bathtubs (2%). (5) For the drownings in swimming pools, approximately 56% were children under age 10. Furthermore, this age group accounted for about 77% of the drownings in private swimming pools. Inadequate fencing around the pools was reported to have been a factor in many of these drownings. (6)

Available information from the 1971 HEW study on rescue and resuscitation efforts show that the body was not recovered for at least 30 minutes in 70% of the cases. There was also no primary revival effort in 7 out of 10 drownings. (5) A study completed by Dietz and Baker in Maryland (7) had similar results. They reported that of the drownings they reviewed, 75% were witnessed and in most cases the witness was old enough to have learned lifesaving and resuscitation techniques. However, the speed with which the victim slipped out of view and the failure of recovery efforts in the first few minutes were major obstacles to successful resuscitation attempts.

Preexisting illness has been found to be a risk factor in drowning. Dietz and Baker (7) found that 6% of the drownings they reviewed had a preexisting illness that may have contributed to the drowning. These medical conditions include seizures, severe mental retardation, organic brain syndrome, and myocardial infarction. The percentage of victims with preexisting illnesses was even greater (20 percent) in their alcohol study group. Of the 20 persons in the combined primary and alcohol study groups in whom illness was identified, eight were known to suffer from seizure disorders.

The role of alcohol in drowning has been documented in several studies. Dietz and Baker (7) reported that 47% of the victims aged 15 years or more had consumed alcohol and that 38% had blood alcohol concentrations (BAC's) of .10 percent or higher. Plueckhahn (8) completed a 25-year study in Australia and he found that 55% of all men 20 years and older who drowned had consumed alcohol, 37% had BAC's of .08 percent or higher, and 29% had BAC's of .15 percent or higher. Plueckhahn also cited the Davis and Smith study in South Africa, in which 64.1% of the drowning victims 15 years or older had consumed alcohol and 50.2% had BAC's higher than .10 percent, and the Cairns, Koelmoyer, and Smeeton study in New Zealand, in which 50% of those age 15 and over had consumed alcohol and 37% had BAC's in excess of .10 percent.

METHODOLOGY

The present study examines 1980-1984 drowning deaths that occurred in North Carolina. Information about these deaths was obtained from the Office of the Chief Medical Examiner at Chapel Hill. Under North Carolina law, all suspicious, unusual, or unnatural deaths are to be investigated by licensed physicians participating in the Medical Examiner System. Data on the Medical Examiner file include demographics of the decedent, means of death, place of death, and if applicable, autopsy and toxicology information. Most of these data are entered into a computer file; however, important sections of the Medical Examiner file such as a narrative summary of circumstances surrounding the death are not put in computer-readable form. Therefore, a "Drowning Abstract Form," shown in Appendix 1, was filled out and matched to the computer file to form a complete case history for each decedent. Appendix 2 shows the activity and setting codes used.

Each data item on the abstract form and selected items on the computer file, such as the decedent's blood alcohol percent, were summarized to form descriptive statistics on all the drownings. Crosstabulations were generated to see how certain characteristics varied by activity of decedent and setting of drowning. For example, a crosstabulation of activity by age of victim was computed to see if certain activities had an age distribution different from that for total drownings. For each activity and setting, only the major differences are reported in the results section. The binomial test of significantly different proportions was used to indicate which differences were not likely to be due to random variation.

RESULTS

Total Drownings

A total of 1,052 drownings for the period 1980-1984 were abstracted from the Medical Examiner file. The demographics of these drownings are shown in Figures 1 and 2. Males accounted for 87% of the drownings and

males ages 15-29 accounted for 36% of the drownings. The approximate rates of drowning* show that nonwhite males had the highest rates across all the age groups, with the highest being in the 15-29 age group (11.7 per 100,000 population). The rate of drowning was also higher for nonwhites than for whites (4.8 vs 2.6) and higher for males than for females (5.8 vs 0.8).

* Rates are approximate due to the use of the Medical Examiners File which does not include North Carolina residents who drown out of state. Victims who were out-of-state residents were not used in the computation of the rates.

Figure 1

1980–84 North Carolina Drownings
by Race and Sex

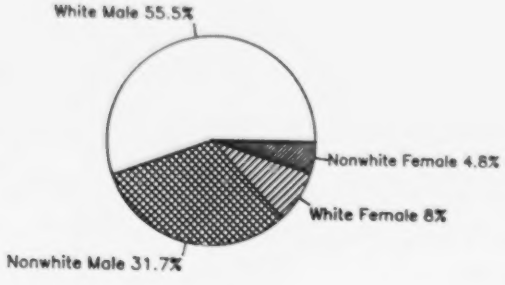


Figure 2

1980–84 North Carolina Drownings
by Age, Race, and Sex

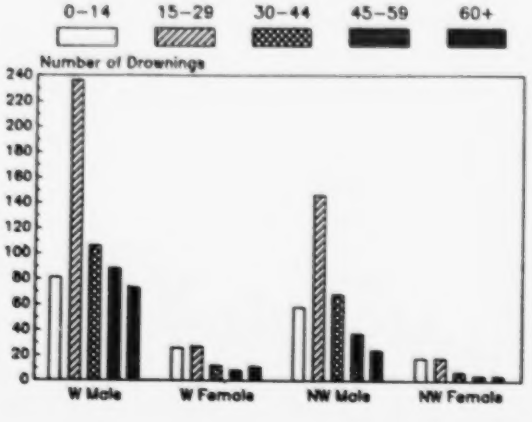


Figure 3 depicts drowning by activity. Swimming (including wading) accounted for the highest percentage of drownings, followed by "all other" and fishing. The overwhelming majority of the activities in the "all other" category were unintentional falls into a body of water such as a creek, ditch, or pond, and activities that were unknown.

Figure 3

1980–84 North Carolina Drownings
by Activity

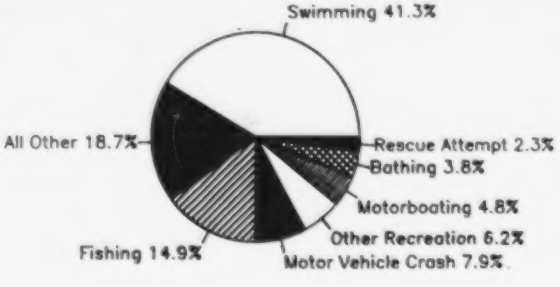
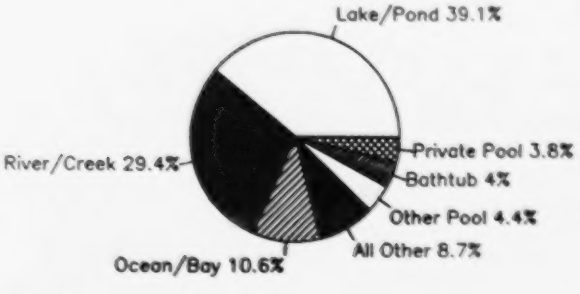


Figure 4 shows drownings by setting. Lakes or ponds had the highest percentage of drownings followed by rivers or creeks and ocean or bays. In the "all other" category, incidental water (water that is temporarily in a location such as a ditch full of water) had the highest percentage of drownings, followed by rock quarries and canals.

Figure 4

1980–84 North Carolina Drownings
by Setting



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The places where drownings most frequently occurred are listed in Tables 1 through 4. Nags Head was the coastal town (places within 5 miles of the ocean and less than 10,000 population) with the most drownings followed by Emerald Isle and Sneads Ferry. The body of water with the most drownings was the farm pond, with the Atlantic Ocean and unspecified ponds tied for second. The pond was usually unspecified when it was too small to be named. Lake Norman, located near Charlotte, was the lake with the most drownings and the Cape Fear River, which runs through Wilmington, was the river with the most drownings.

Table 1

North Carolina Coastal Towns with 4 or more Drownings, 1980-84

Town	Number of Drownings
Nags Head	10
Emerald Isle	8
Sneads Ferry	7
Beaufort	5
Kill Devil Hills	5
Ocracoke	5
Wrightsville Beach	5
Atlantic Beach	4
Carolina Beach	4
Sunset Beach	4

Table 2

North Carolina Bodies of Water with 15 or more Drownings, 1980-84

Body of Water	Number of Drownings
Farm Pond	64
Atlantic Ocean	57
Unspecified Pond	57
Bathtub	42
Private Swimming Pool	40
Unspecified Creek	30
Lake Norman	24
Ditch	23
Cape Fear River	21
Unspecified Lake	19
High Rock Lake	18

Table 3

North Carolina Lakes with 5 or More Drownings, 1980-84

Lake	Number of Drownings
Lake Norman	24
High Rock Lake	18
Kerr Lake	14
Gaston Lake	12
Hyco Lake	10
Badin Lake	9
Lake James	9
Falls Lake	7
Belews Creek Lake	6
Lake Hickory	6
Lake Santeetlah	5
Lake Wylie	5

Table 4

North Carolina Rivers with 5 or More Drownings, 1980-84

River	Number of Drownings
Cape Fear River	21
Neuse River	13
Lumber River	12
Catawba River	11
Tar River	10
Pamlico River	9
Tuckasegee River	9
Roanoke River	8
New River	7
Yadkin River	7
Chowan River	6
Dan River	6
Oconaluftee River	6
French Broad River	5
North River	5

The number of drownings decreased 45% from 1980 to 1981, dropping from 305 to 167. All four race-sex group drownings declined considerably with nonwhite females showing the largest decline at 93% (28 to 2). This decrease was also noted in drownings associated with motor vehicle crashes, swimming, and "all other" activities. Since 1981, the total number of drownings has fluctuated: 176 in 1982, 219 in 1983, and 185 in 1984. However, other recreational drownings and bathing drownings have increased over time.

Other information from the drowning abstract form shows that 56% of the drownings were witnessed. The percentage witnessed by activity ranges from 92% for swimming in a group to 3% for bathing in a bathtub. For setting it ranges from 95% for drownings in an inlet to 2% for drownings in a bathtub. Of the 74 children 0-5 years old who drowned, 59 or 80% were unattended. Twenty-nine of these children fell into a body of water such as a swimming pool or a lake, eight were bathing in a bathtub, and seven were swimming or wading in a swimming pool. Of the drownings that were witnessed, 33% had a resuscitation attempt. This percentage did not vary much by activity, but for setting it ranged from 97% for swimming pools to 10% for inlets.

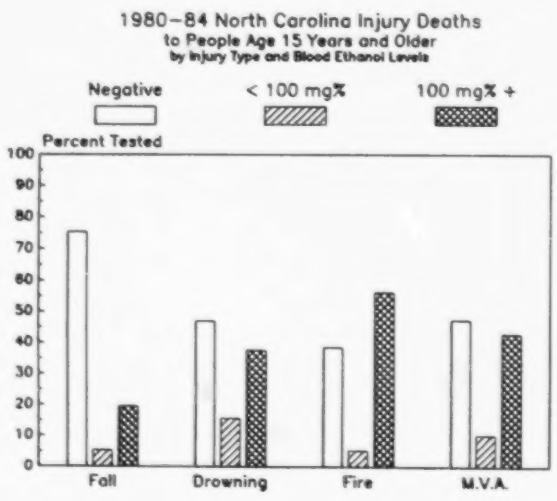
Activities most likely to involve other persons in the incident in addition to the drowning victim (other people's lives were in danger) were motor vehicle crashes (61%), motorboating (61%), and canoeing/rafting (50%). The overall percentage of drownings in which other persons were involved was 24%. Activities most likely to involve other fatalities in the incident in addition to the drowning victim were rescue attempts (57%), motor vehicle crashes (42%), and motorboating (27%). For total drownings this percentage was 13%.

Medical information from the abstract form shows that of the drowning victims 8% had significant fatty liver reported, 6% had significant cardiovascular disease, and 7% had seizure disorders. The number of drowning victims with mentioned health conditions did not vary much by activity except for victims with seizure disorders, who accounted for 53% of the drowning victims who were bathing in a bathtub.

Alcohol Involvement in Drownings

Of the 1,052 drownings for which information was abstracted, 839 or 80% of the victims were tested for blood ethanol. The reasons why some victims were not tested include the youth of the victim, the survival time after the injury, and the decomposition of the body. Of those tested for blood ethanol, 52% were negative, 14% had a blood ethanol level less than 100 mg% (less than 100 mg/dl or .10% blood alcohol concentration), and 34% had a level of 100 mg% or greater. (A person is legally intoxicated in North Carolina if his blood alcohol percent is .10 or greater.) For decedents ages 15 and over, the percentage of drowning victims with a blood ethanol level of 100 mg% or greater was 38. In comparison, Figure 5 shows that, among persons ages 15 and over, 19% dying from falls, 56% dying by fire, and 43% dying in motor vehicle crashes were legally intoxicated.

Figure 5



The variations of blood ethanol levels by race-sex group, age group, activity, and setting are exhibited in Figures 6 through 9. The population groups with highest intoxication levels were nonwhite males (40%), 30-44 year-olds (50%), and 45-59 year-olds (42%). The activity with the highest intoxication level among drowning victims was motor vehicle crashes (51%) and the settings with the highest intoxication levels were rivers and creeks (41%) and other settings (42%). Population groups by activity or setting with the highest intoxication levels include nonwhite males who drowned in a stream or creek (67%), nonwhite males who drowned in a motor vehicle crash (82%), and 30-44 year-olds who drowned while swimming alone (74%).

Figure 6

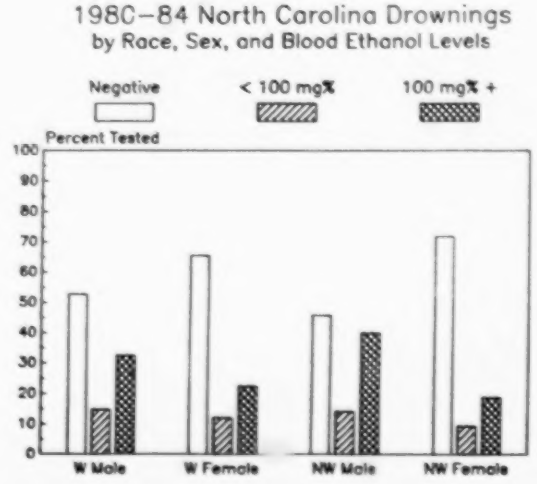


Figure 7

1980–84 North Carolina Drownings
by Age and Blood Ethanol Levels

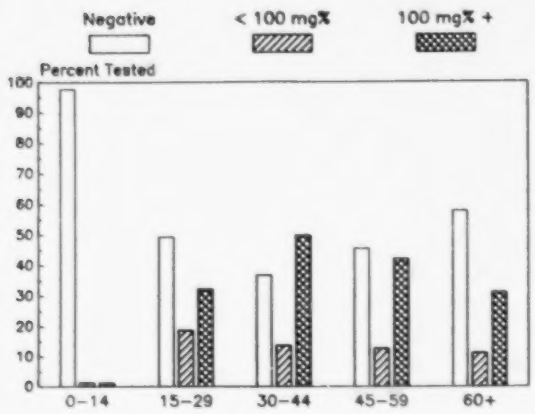


Figure 8

1980–84 North Carolina Drownings
by Activity and Blood Ethanol Levels

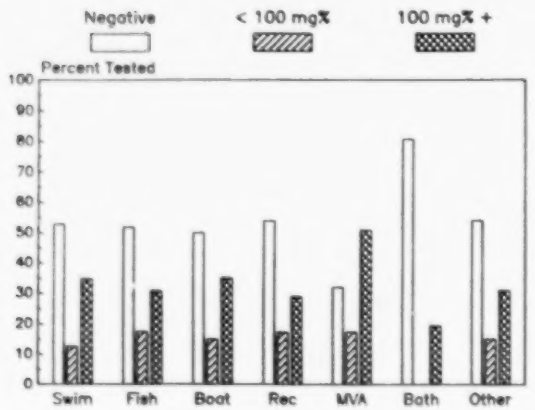
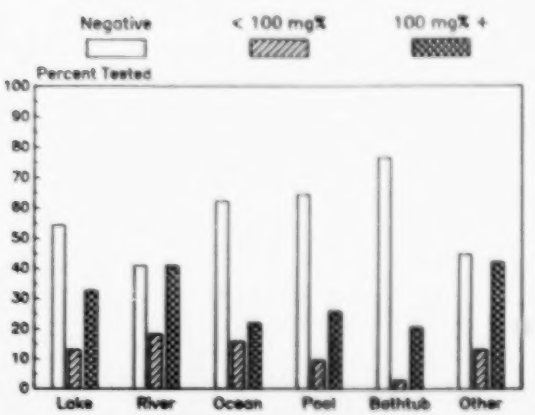


Figure 9

1980–84 North Carolina Drownings
by Setting and Blood Ethanol Levels



Drownings by Demographic Characteristics

The activities that differed from total drownings by sex distribution were activities related to fishing, motorboating, motor vehicle crashes, and bathing. Males accounted for 98% of the fishing deaths and 96% of the motorboating deaths. The overrepresentation of males in fishing fatalities was seen in both races, with nonwhite males being overrepresented in fishing-from-shore deaths and white males being overrepresented in fishing-from-boat deaths. Females accounted for a relatively high percentage of drownings in motor vehicle crash deaths (27%) and bathing deaths (43%). Most of the females who drowned in motor vehicle crashes were passengers.

The age distribution of drowning victims varied by activity. Children less than the age of 5 years accounted for 6% of total drownings, but 25% of bathing drownings and 20% of "all other" drownings. Persons 10-24 years old represented 38% of total drownings but 60% of swimming deaths. Males 10-24 years old were highly represented in the category of swimming deaths. Of the 352 males ages 10-24 who drowned, 66% drowned while swimming. Furthermore, of the 147 nonwhite males ages 10-24 who drowned, 77% drowned while swimming.

The race-sex distribution of drownings was skewed in motorboating and other recreational deaths. White males were overrepresented in motorboating deaths, accounting for 71%. This was especially true of white males aged 25-59 years, as they accounted for 49% of the motorboat drownings compared to 24% of the total drownings. White males were also overrepresented in other recreational (canoeing, sailing, scuba diving, water skiing, etc.) drownings, accounting for 82%. Furthermore, 37% of the other recreational drowning victims were white males ages 15-39 years.

Variation in the demographic characteristics of drowning victims was also evident by setting. For example, females represented 28% of the private pool drownings and children less than the age of 5 years accounted for 43% of these drownings. In public or motel pools, however, nonwhites constituted 59% of the drownings and persons age 10-19 years represented 52% of these drownings, yet only 23% of the total drownings. The age difference between drownings in private pools and those in public or motel pools was also evident in the victim's activity before drowning. In the public and motel pools, 91% of the drownings were swimming deaths. However, in private pools only 63% of the drownings were swimming deaths. The reason for this discrepancy was the large number of children who fell into a private pool.

Several settings had skewed race-sex distributions compared to total drownings. Nonwhite males accounted for a high percentage of drownings in ponds (50%) and in incidental water (47%), while white males accounted for a high percentage of drownings in a rock quarry (77%) and in the ocean (75%). Males 15-29 years old especially were overrepresented in rock quarry drownings, accounting for 82%.

DISCUSSION

The purpose of this paper is to examine the circumstances and settings associated with North Carolina drownings. A significant finding is the large number of non-swimming drownings. Many of the decedents in the study simply fell into the water, either from a boat while fishing or into a swimming pool while playing. These are people who apparently had no intention of getting wet, but suddenly found themselves in a lethal situation. Another significant finding is the large number of drownings occurring in small ponds, creeks, and rivers. With approximately 320 miles of shoreline and thousands of people swimming there each year, it is somewhat surprising that the Atlantic Ocean made such a small contribution to the total number of drownings in North Carolina.

The most profound results of this study, however, are the alcohol findings. Of the 839 drowning victims who were tested for blood alcohol, 283 or 34% had a blood alcohol concentration of 100 mg% or greater. This is equivalent to .10% blood alcohol, which under North Carolina law means the person is legally intoxicated. This level of intoxication was found in 38% of ages 15 years or older with the highest frequency evident among middle-aged males. Furthermore, in several types of activities and settings associated with drowning, blood alcohol concentrations of 100 mg% or greater were found in 33% or more of the drowning victims.

A shortcoming of this study is the absence of information about swimming ability. It would have been useful, for example, to identify what proportion of drowned persons were excellent, good, fair, or nonswimmers. The reason this was not undertaken was that the data in the Medical Examiner records pertaining to swimming ability were found to be too imprecise and also were too infrequently reported. Even if this information were accurate, it would not be possible to determine here the safety benefits of swimming ability per se. An epidemiologic study designed for that purpose would have to compare the abilities of swimmers who drown with those of uninjured persons exposed to similiar circumstances. (1)

Even with the absence of data on swimming ability, this study does suggest that some drownings are preventable. For example, most of the 126 drowning victims who were swimming or wading alone (see Appendix 2) might have been saved if the victims were swimming with someone who knew basic rescue techniques. This is why the American Red Cross (9) recommends never swimming alone, no matter how well you swim. The drownings that occurred while swimming or wading in a group might have been prevented if the victim had known how to recognize hazardous conditions and practices, such as swimming while intoxicated, or if others in the group knew of appropriate rescue techniques. Since the majority of these drownings occurred in the 10-24 age group, a water safety course either in grammar school or high school may be of some help.

Other drownings that were preventable were the 205 drownings that involved boats. Although information on personal flotation devices (PFD's) was not collected in this study, Shkrum (10) reportd that in 69% of the boating fatalities in North Carolina from 1981 to 1983, the victim was not wearing a PFD. The State of North Carolina can help reduce boat-related drownings by changing the law regarding PFD's. The current law states that for everyone in a boat there must be a coast guard approved PFD readily accessible [General Statute 75A-6 (F)]. However, if the law were changed to require everyone on a boat to ***wear*** an approved and appropriate PFD, it is probable that the number of boat-related drownings would decline. It should be noted that the American Red Cross (9) recommends that everyone wear a PFD, especially nonswimmers and novices.

Drownings that were clearly preventable are the 74 drownings in the 0-5 age group. Adult supervision would have had an immediate impact on these drownings, especially the ones that occurred in bathtubs and swimming pools. However, adequate supervision of children appears to be difficult to teach and impossible to legislate. (11) Waller (1) suggests that adequate fencing around swimming pools with a high, hidden, self-closing, and self-locking latch would be a preventive measure. Unfortunately, it is unknown how many children drowned in unfenced swimming pools. Rivara (11) suggests that swimming instruction for toddlers might help decrease the number of drownings in this group, but there is as yet no conclusive evidence to suggest that these "water baby" type programs are effective in preventing drowning deaths among the very young.

Some drownings that involve motor vehicle crashes are preventable because the majority of the victims were intoxicated. The recent enactment of tougher drinking-and-driving laws may help to reduce the number of these drownings. The State of North Carolina could also build more guardrails along roads bordering ditches and waterways and increase the spatial separation between roads and canals or other bodies of water in order to further reduce the number of motor vehicle crash drownings (12).

A statistic that suggests the need for additional therapeutic measures by first responders is the low percentage (33%) of resuscitation attempts among drownings that were witnessed. A possible reason for this is delay in the retrieval of the victim because of the inability to locate the body underwater. Rapid identification of persons in trouble underwater could be augmented by more visible swimwear, underwater lights in pools, and lights on boats (12). Maclachlan (13) suggests that another possible reason for the low percentage of resuscitation attempts among drowning victims may be a lack of knowledge by the public of emergency first aid procedures. A concerted campaign to increase the number of people with life-saving skills would probably help reduce the number of drownings.

Another statistic that suggests preventive measures is the high percentage (57%) of "other fatalities" among drownings that involved rescue attempts. In most cases, the rescuer jumped in the water to try to save the person in trouble, with the unfortunate consequence of both persons drowning. The American Red Cross (9) strongly discourages this practice, as they claim that reaching assists are the safest methods of rescue. The rescuer should reach with whatever is available such as an arm, a leg, a pole, a towel, a branch, or a ski. This should be strongly recommended to all school children in their health education courses.

The high percentage of persons with significant seizure disorders (53%) among drownings while bathing in a bathtub is worth noting. Although data on populations at risk were not available for this study, recent studies suggest that there is a higher risk of drowning among people with epilepsy (14). Therefore, it may be prudent to warn epileptics and people with other seizure disorders about their increased risk of drowning.

The large decrease in the number of drownings from 1980 to 1981 is also worth noting. This decrease was especially prevalent in swimming deaths, motor vehicle crash deaths, and "all other" deaths. Examining the trend of the number of drownings during the past ten years, one finds that 1980 had an unusually high number and that the general trend during the latter part of the seventies was one of decline. At this time there is no apparent reason for the high number of drownings in 1980.

Results from this study that are consistent with all drowning studies are the race and sex differences in drowning rates. Baker (2) suggests that a possible reason for the higher male drowning rate is the difference between the sexes in exposure to potentially hazardous activities. Also, Buescher (15) found that males are much more likely than females to abuse alcohol. Waller (1) believes that the contrast between the races in drowning rates may be due to nonwhites having less access to organized instruction in swimming techniques and nonwhites being more likely to have recreational access to only unguarded swimming areas such as rivers, canals, and ponds.

A result that is prevalent in a number of drowning studies is the high rate of alcohol intoxication among drowning victims. A possible reason for this is that alcohol has a depressant effect on the central nervous system. Plueckhahn (8) states that such depression will result in a decreased awareness of sensory stimuli, a depression of conditioned reflexes, and consequently a reduced ability to deal with unexpected situations or emergencies. Pearn (16) adds that alcohol will also impair judgment and increase one's risk of water injuries and of immersion.

Another explanation for the high rate of alcohol intoxication among drowning victims is that alcohol can depress one's swallowing and breathing reflexes. For example, Gooden (17) believes that general cerebral depression from alcohol may lead to failure of the larynx to prevent aspiration of water, interference with the normal increased delivery of oxygen to the brain after sudden immersion in water (the diving response), and a reduction in sensitivity of the brain's respiratory center to increasing carbon dioxide levels in the blood. All three of these conditions may lead to rapid loss of consciousness and an increased risk of drowning compared to a non-intoxicated person.

In conclusion, it is hoped that this paper shows that most drownings are not "accidents" that are attributable to chance or bad luck. The prevention of drownings can and should be a major public health undertaking. Federal, state, and local governments can help through environmental modification, stricter regulation enforcement, and more public education programs. The goal is to change an individual's behavior and public health officials can help society realize that safe, responsible behavior will ultimately reduce the number of drownings. (13)

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Appendix 1

DROWNING ABSTRACT FORM

1. Case Number:

   _ _ _ _ _ _ _ _

2. Race:

   ☐ 1. White ☐ 3. American Indian
   ☐ 2. Black ☐ 4. Other

3. Sex:

   ☐ 1. Male ☐ 3. Undetermined
   ☐ 2. Female

4. County of Residence:

   _ _ _

5. Specific body of water where drowning occurred (i.e., Lake Wheeler, Haw River):

   _____

6. Specific town or city where drowning occurred (i.e., Atlantic Beach):

   _____

7. Condition of Fatty Liver:

   ☐ 1. Yes ☐ 3. Not Stated
   ☐ 2. No

8. Condition of significant cardiovascular disease:

   ☐ 1. Yes ☐ 3. Not Stated
   ☐ 2. No

9. Condition of seizure disorders:

   ☐ 1. Yes ☐ 3. Not Stated
   ☐ 2. No

10. Specific activity engaged in before drowning (see Activity Codes):

    _ _

11. Specific setting where drowning occurred (see Setting Codes):

    _ _

12. Were there other people involved in the incident?

    ☐ 1. Yes ☐ 3. Not Stated
    ☐ 2. No

13. Were there other fatalities involved in the incident?

    ☐ 1. Yes ☐ 3. Not Stated
    ☐ 2. No

14. Was there a resuscitation attempt?

    ☐ 1. Yes ☐ 3. Not Stated
    ☐ 2. No

Appendix 2

Frequency of Drownings in Activities and Settings

Code	Activity	Number of Drownings
01	Swimming/wading alone	126
02	Swimming/wading in a group	273
03	Swimming/wading unknown number	36
04	Fishing from shore	43
05	Fishing from a boat	100
06	Fishing, other or unknown	14
07	Motorized watercraft accident while cruising	19
08	Motorized watercraft accident while drifting	8
09	Motorized watercraft accident while craft secured	3
10	Motorized watercraft accident, other or unknown	21
11	Canoeing/paddling/sailing/rowing/ rafting	54
12	Scuba diving	5
13	Water skiing	4
14	Surfing	2
15	Motor vehicle accident — driver	48
16	Motor vehicle accident — passenger	35
17	Motor vehicle accident — other or unknown	0
18	Bathing in a bathtub	38
19	Bathing, unknown	2
20	Involved in a rescue attempt	24
99	Unknown or other activity	197

Code	Setting	Number of Drownings
01	Lake	270
02	Pond	141
03	River	204
04	Stream/creek	105
05	Ocean	57
06	Sound/bay/harbor	33
07	Inlet	22
08	Private Pool	40
09	Public Pool	20
10	Commercial/Motel pool	25
11	Other or unknown pool	1
12	Bathtub	42
13	Incidental water	34
14	Canal	13
15	Quarry	22
16	Swamp	1
17	Well	2
99	Other or unknown setting	20

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